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ACE Tax vs ASE Tax:

The Croatian and Nordic Experience for Higher Neutrality

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Abstract

We may freely state that taxes bear two-sided nature. The first one and that is the good side of their essence is all about their role in contemporary public finance, sustaining the financial health of the modern-day state if properly managed. The second more menacing nature that occupies the interest of this article attributes to economic efficiency and the relatively high potential of taxes to disrupt the activities of economic participants, and the possibility to create a deadweight loss in the economy. Tax distortions are common for all the different groups of taxes, but for the corporate taxes are exceptionally evident. For example, one of the most typical is the distortion of corporate finance, when the choice for the financial alternative of the investment project is made. Induced by the traditional, "classical" treatment of corporate profit, according to which interest payments are deductible from the corporate income tax base, the debt source of finance is commonly considered as tax preferred as compared to the equity source of finance, which is oppositely fully taxed in most of the cases. This will provoke unusual behavior of the company, to rely more on borrowed capital, thus increasing the chances of insolvency and business failure. To eliminate the debt-equity distortions, the leading economic organizations have recommended lately, some alternative forms of corporate tax systems that preserve relative capacities to offset the excessive burden on the external equity supported investments.

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The Allowance for Equity Tax system is such a proposal of the OECD. It comes in 2 basic forms, the Allowance for Corporate Equity Tax system (ACE), a model from the Croatian experience and the Allowance for Shareholders Equity Tax system (ASE), known as the "Nordic" form of corporate tax. The intention of this article is to explore their properties from the view of neutrality and the allocation criteria and compare the findings with the Classical Corporation Tax (CCT), for which purpose the basic methodology of EMTR is additionally modified and extended. We hope to prove that these solutions represent solid alternatives for the "classical" approach in corporate taxation if the goals for neutrality and economic efficiency are concerned.

Keywords: corporate income tax; cost of capital; effective marginal tax rate; classical corporation tax; debt; new equity issues; double taxation.

JEL Classification Numbers: H25, H32, D92

1. Introduction

Recently, we've described and explained the distortions that usually arise from the isolated implementation of corporate taxes, a condition which assumes total abstraction of the personal taxes. In this article, we also include the personal taxes in our analysis, with intention to explore the investment decision, not only from the company's perspective, but from the shareholder's point of view as well, a condition commonly referred as "double taxation". This phenomenon is granted to fact that the corporate tax base (i.e. the corporate income) cannot be limited only at the corporation observed as a form of legal entity. Usually, under the classical corporation tax regime, after the initial taxation at corporate level, corporate profits are distributed to the shareholders in a form of dividends, capital gains or interest payments, and are subject to additional taxation at personal level.

The ultimate consequence of the referred phenomenon is imposition of an additional "extra" burden on total corporate profit expressed integrally from its source to its destination. Respecting that this "excessive" taxation of the profit is considered unfair and could distort the economic activity of firms, the authorities try to construct more appropriate "neutral" tax systems with attributions to effectively tax the economic rents (or the extra profit) and at the same time avoid taxation of the normal return. In addition, we give a brief literature review to some integrated modalities of corporate tax systems with the desired properties that actually allow a higher degree of neutrality in corporate taxation. The following tax systems are protagonists proposals of the OECD (Organization for Economic Co-operation and Development), as a part of the tax reform that was undergone recently. Acknowledged as more convenient to eliminate the difference between debt and equity associated with the "classical" approach in corporate taxation, they are: the Full Integration Tax System (FIT), the Allowance for Corporate Equity Tax System (ACE), the Allowance for Shareholders Equity Tax System (ASE), the Comprehensive Business Income Tax (CBIT) etc.

It is a frequently known truth that borrowed capital is a superior source of finance from the taxpayer's point of view, as a result of the usual and widely excepted treatment of interest payments. In practice, since companies are allowed to deduct interest payments from their corporate income tax base, the system subsidizes the debt

source finance in a manner that the action reduces the opportunity cost (the discount rate) of the debt-financed investment. This gives a certain advantage to the debt finance, since it is tax preferred in front of equity, which oppositely is fully taxed. The last triggers unfavorable behavior of the company, to use more borrowed capital, thus increasing the risk of bankruptcy and insolvency of the firm. This presents the most common and typical distortion of corporate finance, induced by the traditional, "classical" treatment of corporate profit. But, as mentioned above, the leading economic organizations such as the OECD, have made a break-through in the sphere of business taxation, proposing some alternative models of hybrid tax systems, that are much or less distinctive from the "classical" approach and more evenly allocate the burden across the different sources of finance, for example such as the concept of the Allowance for Equity Tax system. The idea was to create equal "symmetric" treatment between debt and equity within the corporate income tax regime, therefore under the Allowance for Equity Tax system companies can deduct an imputed normal return on their equity from the corporate income tax base or the personal (shareholders) income tax base parallel to the deduction for interest on debt. According to this, the concept could be found in 2 basic forms. The first one is the Allowance for Corporate Equity Tax system (ACE), a model from the Croatian experience, and the second one is the Allowance for Shareholders Equity Tax system, which is known as the "Nordic" model of corporate tax. If implemented properly, regardless the form of this concept, the result should be neutrality and indifference between debt and equity.

The intention of this article is to explore and test the technical properties of the ACE and the ASE tax from the view of neutrality and the allocation criteria and compare the findings with the Classical Corporation Tax (CCT), for which purpose the methodology of EMTR is effectively utilized. The significance of the CCT system, which is widely considered as a classical example model of the pure "double" taxation of corporate income, is based on the fact that it can be employed as a benchmark model for the function of comparison and measurement against the alternative systems intended to be analyzed here. For that reason, we only introduce it briefly, before we move on with the analysis of the referred systems.

2. Modifying the basic methodological frame

We pay our attention in this from the following series of articles, exclusively on the investments financed with new equity issues (external equity). As we know from business practice, equities could be found in 2 (two) fundamental forms: external equity (new equity issues), which provides the equity capital for the ongoing projects externally, through issues of the new company's shares on the capital market; and retained earnings (retentions of profit), which are formed from the company's accumulated (non-distributed) profit, usually subject of reinvestment. The models of taxation discussed in this article, could be easily applied in the investment scenario covered with retained earnings as well, of course modified with its specific circumstances. With the purpose to achieve more detailed, systematic approach in exploration of the attributions and specificities of the models, we decided to study them separately, and dedicate this article only for the new equity finance. Other reasons for this are the limited space, minimizing the risk for confusion, and providing a better comparison of the effects. The basic methodology is consisted of the effective marginal tax rates analytical frame (EMTR), which is additionally modified and extended to express all the newly occurred conditions that define "double" taxation of corporate profit. With the adapted methodology of EMTR, we have managed to

identify and explain multiple varieties of integrated systems with relative (theoretical) capacities to generate more neutral taxation on the external equity-supported investment. Here, we present only the ACE and the ASE tax and compare it with the basic model of the CCT.

As already mentioned, preferably, the measurements of tax rates should be expressed at marginal level, because the focus of this research is put on the allocation criteria. According to King & Fullerton, the effective marginal tax rate could be defined as a ratio between the tax wedge and the pre-tax rate of return [1]:

$$EMTR = \frac{\tilde{p} - s}{\tilde{p}} \qquad (1)$$

Identical concept of the EMTR is also advocated by authors Devereux & Griffith [2], [3], [4]. The methodology developed by Devereux & Griffith extended the already existing concept proposed by King & Fullerton, and in the following years they refined their approach resulting in a standardized methodology accepted by the most economic organizations and institutions (OECD). The effective marginal tax rate on corporate income is defined identically as previously mentioned, where p ˜ is the cost of capital (the pre-tax rate of return on investment) defined as:

$$\tilde{p} = \frac{(1-A)\{\rho + \delta(1+\pi) - \pi\}}{(1+\pi)(1-t)} - \frac{F(1+\rho)}{\gamma(1+\pi)(1-t)} - \delta \qquad (2)$$

Where:

- Symbol t is the corporate income tax rate;

- Symbol π is the inflation rate in the current period;

- Symbol A is the net present value of tax depreciation allowances;

- Symbol δ is the economic (true) depreciation rate;

- Symbol γ is the tax discrimination variable developed to measure tax discrimination between the equity retentions and the equity distributions. Under the condition of absence of personal taxes, this variable's value is 1 ($\gamma = 1$), but in presence of the personal taxes the variable's value differ from 1. If we consider m^d to be the personal tax rate on dividend income, z the effective personal tax rate on capital gains and c the tax credit rate allowed for dividends paid, then in the case of implementation of personal taxes, the tax discrimination variable requires the form of:

$$\gamma = \frac{(1-m^d)}{(1-z)(1-c)} \qquad (3)$$

- Symbol ρ is known as the shareholders discount rate, which in absence of personal taxes generates value equal

to the nominal interest rate ($\rho = i$). Now, if we consider m^i as the personal tax rate on interest income, since the personal taxes are involved, the shareholders discount rate receives the form:

$$\rho = \left(\frac{1 - m^i}{1 - z} \right) i \qquad (4)$$

- Symbol F from the expression above represents the financial constraints variable and its value is determined according to the source of finance. For instance, if the project is financed through new equity issues, than the financial constraints variable F^{NE} is measured as:

$$F^{NE} = -\frac{\rho(1-\gamma)}{(1+\rho)} \qquad (5)$$

And if the firm borrows external debt (bonds or bank loans) to finance its project, in that case the financial constraints variable F^{DE} is calculated as:

$$F^{DE} = \frac{\gamma[\rho - i(1-t)]}{(1+\rho)} \qquad (6)$$

In order to isolate the pure effects that arise from the imposition of the code, as well as to simplify the calculation for the purpose of a better illustration of the effects, once again, we suggest the following assumptions: the net-present value of depreciation allowances is assumed 0 ($A = 0$), there is no inflation in the economy ($\pi = 0$, $\rho = r$), the rate of economic depreciation is assumed 0 ($\delta = 0$) and the real interest rate is positive ($r > 0$).

Considering the previous assumptions, than expression (4) for the shareholder's discount rate will be transformed to:

$$\rho = \left(\frac{1 - m^i}{1 - z} \right) r \qquad (7)$$

While expression (2) for the cost of the capital will be rearranged to:

$$\tilde{p} = \frac{\rho}{(1-t)} - \frac{F(1+\rho)}{\gamma(1-t)} \qquad (8)$$

2.1. The investment tax wedge coefficient

Before we proceed, we'd like to refer to our main analytical tool, and that is, the investment tax wedge coefficient. Precisely, the element from the EMTR ($\tilde{p}$ - s), the tax wedge, can be divided into 2 parts: a) the

investment tax wedge and b) the savings tax wedge [5]. The second term is measured as ($r - s$) and it represents the effective tax burden on the saver's income, which is irrelevant for the analysis. The first term which is crucial for our research is measured as a difference between the investor's rate of return before taxes (the cost of capital) and the real interest rate ($\tilde{p} - r$) and it's an expression for the effective tax burden on the investor's (or company's) capital income. Depending on the relation between $\tilde{p}$ and r, we can distinct 3 different conditions. The first condition is when the effective tax burden is positive ($\tilde{p} > r$) and as a result of that, the tax system depresses the investment activities. In terms of integrated taxation of company's income, this means that both, the economic rent and the normal return are effectively taxed. The second condition is when the effective tax burden is equal to 0 ($\tilde{p} = r$), when the tax system is neutral to the investment decision. In other words, under these conditions, the normal return of corporate profit is left from taxation and only the extra profit is being subject to taxation. And the third and the most preferable condition from the investor's point of view is when the effective tax burden is negative ($\tilde{p} < r$), when the tax system supports the overall investment. Here, the investment is being effectively „subsidized" by the system, enabling the investor to legally escape from taxation a rate of return higher than the normal rate of return. In perfect economies without presence of taxes, the cost of capital is identical with the real interest rate ($\tilde{p} = r$) and the economic agents are completely indifferent between the investment decision and the decision to save. The existence of the national tax system diverges the difference between the cost of the capital and the interest rate and therefore creates a positive tax wedge ($\tilde{p} > r$).

2.2. Recalling to the effects from the sole implementation of corporation tax

In order to create foundation for comparison and differentiation between the effects, we briefly recall on the possible outcomes from the scenario where the corporate tax is solely, individually applied on capital income, without any presence of the personal taxes. As it has been described, the isolated implementation of corporate income tax creates uneven distribution of the burden across the different sources of finance (see Table 3 from below). The investment tax wedge on the debt-financed investment is measured as:

$$\tilde{p} - r = 0 \qquad (9)$$

While for the equity-financed investment, it received the form of:

$$\tilde{p} - r = r\left[\frac{1}{(1-t)} - 1\right] \qquad (10)$$

or

$$\tilde{p} - r = \frac{rt}{(1-t)} \qquad (11)$$

Usually, all equity-financed investments, regardless their form, are more discriminated against the investments covered with debt. The first ones are levied with a positive effective tax burden that is determined in proportion of the level of corporate income tax rate t. At the other alternative, the zero burden on investment indicates on

the presence of neutrality in taxation.

2.3. The cost of capital in each investment alternative

And finally, we derive the cost of capital for each investment alternative under the conditions that require simultaneous implementation of the corporate and the personal income tax, with the help of equation (8). For that reason, first we'll consider a hypothetical investment project financed with external debt. Adequately, equation (6) for the financial constraints variable in the case of debt-financed investment is inserted in equation (8) for the general expression of the cost of capital, from which we will obtain:

$$\tilde{p} = \frac{\rho}{(1-t)} - \frac{\frac{\gamma[\rho - r(1-t)]}{(1+\rho)}(1+\rho)}{\gamma(1+t)} = \frac{\rho}{(1-t)} - \frac{[\rho - r(1-t)]}{(1-t)} = \qquad (12)$$
$$= \frac{\rho - [\rho - r + rt]}{(1-t)} = \frac{r - rt}{(1-t)} = \frac{r(1-t)}{(1-t)} = r$$

Accordingly from this, the investment tax wedge in the analyzed investment alternative will be:

$$\tilde{p} - r = r - r = 0 \qquad (13)$$

A conclusion is drawn that, if the overall integrated effect from the corporate and the personal tax is observed, in every case when the investment project is financed with external debt, regardless the existing form of corporation tax, the system will be neutral to the investment decision, *ceteris paribus.* The introduction of personal taxes do not affect these investments in a different way rather than the case of isolated application of the corporation tax, so it is evident that the „double" taxation effect is not present here. All deterministic elements that include the personal taxes, in first order, the tax discrimination variable γ and the shareholder discount rate ρ cancel each other in the equation, producing a zero value investment tax wedge.

The situation is much different if we bring the equity source of finance in our analysis. In order to isolate the most important factor for the investment decision in this financial alternative, term (5) for the financial constraints variable in the case of equity-financed investment is inserted in term (8) for the cost of capital:

$$\tilde{p} = \frac{\rho}{(1-t)} - \frac{-\frac{\rho(1-\gamma)}{(1+\rho)}(1+\rho)}{\gamma(1+t)} = \frac{\rho}{(1-t)} - \frac{-\rho(1-\gamma)}{\gamma(1-t)} = \frac{\rho\gamma}{(1-t)\gamma} - \frac{(-\rho+\rho\gamma)}{(1-t)\gamma} = \qquad (14)$$
$$= \frac{\rho\gamma + \rho - \rho\gamma}{(1-t)\gamma} = \frac{\rho}{(1-t)\gamma}$$

Term (14) is the general form of the cost of capital in the case of investment financed with new equity issues. It resolves that the most dominant factors influencing the marginal investment in this scenario: the shareholder's discount rate ρ, the corporate income tax rate t and the tax discrimination variable γ. Except the corporate tax rate, the other parameters include the components of the personal income tax, specifically the capital income tax

(the personal tax rate on interest income m^i, the personal tax rate on dividend income m^d, the effective personal tax rate on capital gains income z, and the tax credit rate on dividends paid c). This will be utilized furtherly, to extract and analyze the properties of the different tax systems from the view of neutrality and the allocation criteria, first in the case of the Classical Corporation tax and after in the cases of the ACE and the ASE tax system.

3. The Classical Corporation Tax System (CCT)

Now, we introduce in brief the so-called „classical" approach in corporate taxation, which has been traditionally the most used and widely practiced form of corporation tax. The intention is to complete only a short referral of technical properties of the CCT system, thus it will serve as a baseline model for comparison of the other systems discussed furtherly.

Basically, the CCT represents a rudimentary form of corporate tax that treats the corporate income in a conservative and fundamental way. It's a system of taxing companies in which the company is treated as a taxable entity separate from its own shareholders. The profits of companies under this system are therefore taxed twice, first when made by the company and again when distributed to the shareholders as dividends and capital gains. Accordingly, in the essence of the Classical Corporation Tax is double taxation of corporate income.

Speaking in technical terms, a Classical System makes no allowance for "double" taxation, so that dividend income is subject to corporate income tax and taxed again as personal income [6]. The authorities impose the corporate tax at the corporate level differently from the personal taxes at the stockholder level and at the same time do not allow any tax credit on dividend distributions (c = 0). Usually, the combination of the levels (percentage points) of the different tax rates falls under discretion of the policy maker. Considering this, we can identify the CCT system as *(t, m^d, m^i, z, c = 0).*

CCT in debt-financed alternatives. It is easy recognized that the CCT produces a zero investment tax wedge variable if we take in account expression (13) from where we see that the cost of capital in this investment alternative is equal to the real interest rate:

$$\tilde{p} - r = r - r = 0 \qquad (15)$$

CCT in equity-financed alternatives. The implications of the conditions of the classical system in this alternative is initially found in the tax discrimination variable γ:

$$\gamma = \frac{(1-m^d)}{(1-z)(1-c)} = \frac{(1-m^d)}{(1-z)} \qquad (16)$$

Including the equations (16) and (4) in term (14), the cost of capital will become:

$$\tilde{p} = \frac{\rho}{(1-t)\gamma} = \frac{\frac{(1-m^i)r}{(1-z)}}{(1-t)\frac{(1-m^d)}{(1-z)}} = \frac{(1-m^i)r}{(1-t)(1-m_d)} \qquad (17)$$

And finally the investment tax wedge will transform to:

$$\tilde{p} - r = \frac{(1-m^i)r}{(1-t)(1-m^d)} - r = r\left[\frac{(1-m^i)}{(1-t)(1-m^d)} - 1\right] \qquad (18)$$

Consequently, in this case the effects from corporate taxation very often depend on the cross-effects from the personal taxation [7]. Expression (15) shows that the investment decision in this basic and most extended version of taxation of corporate income is determined largely from the inter-relation between the different personal tax rates (m^i and m^d) and the corporate tax rate *t*. It is also self-evident, as we can see from the absence of symbol z, that the effective personal tax rate on capital income is irrelevant for the present model of taxation. The effect from „double" taxation is quantified with the term $(1 - m^i)/(1 - t)(1 - m^d)$. Actually, it represents the combined corporate and personal income tax liability of the CCT, which may have variable values depending on the different dimensions of the relevant tax rates imposed by the code. As a general rule, an *increase in corporate and dividend tax* will generally *increase liabilities and the burden on investment*, while an *increase in interest income tax* will *decrease tax obligations* and *vice versa*. For example, if we take the actual situation in Macedonia, where m^i = 0% (0,00), m^d= 10% (0,10) and *t* = 10% (0,10) [8], [9], [10], the combined tax liability would be 0,2345 or 23,34% and with real interest rate of 10% (0,10) would yield an effective tax rate on investment of 0,0234 or 2,34%. If we assume that an interest income tax of 5% has been introduced lately m^i = 5% (0,05), than the combined tax liability would be 0,1728 or 17,28%, producing an effective tax rate on investment of 0,0172 or 1,72%. On the other hand, if the corporate and the dividend tax are increased on 20% *t* = m^d= 20% (0,20) and m^i = 0% (0,00), it is obvious that the investment tax wedge will additionally increase even on 0,0562 or 5,62%.

4. Allowance for Corporate Equity Tax System (ACE)

Another alternative is the Allowance for Corporate Equity Tax System proposed by Devereux & Sorensen [11] and by the Institute for Fiscal Studies [12]. Under the ACE tax system companies are allowed to deduct an imputed normal return on their equity from the corporate income tax base, parallel to the deduction for interest on debt [13]. This „symmetric" approach in corporate taxation, should ultimately ensure neutrality between debt and equity. The experts suggest that preferably, the allowance on the corporate income tax base should equal the nominal interest rate. According to them, this should allow for the normal return on equity to remain tax free, while the pure rents and extra profits should stay within the channels of taxation. For example, it is very interesting that Croatia has already tested this form of corporate income tax in practice, in the period from 1994 to the beginning of 2001. The imputed rate of return to equity, denoted as „protective interest" (PI), was equal to 5 per cent plus the rate of increase of industrial product prices [14]. In the following text, the effects from the implementation of this system are explored.

Debt. When the investment project is financed with external debt, the corporate tax system under the ACE regime remains neutral to the investment decision. This means that the investment tax wedge will generate value of zero, since interest payments are deductible from the tax base.

New equity issue. It was already mentioned that the usual, normal treatment of the return on equity results with a positive investment tax wedge, as presented in expression (10). With introduction of the ACE system, companies will be allowed to deduct the normal return on equity from their corporate profit tax base. It is thought that the nominal interest rate is a true representation of the normal return on equity, but in our case, that would be the real interest rate *r*, since the inflation rate is assumed 0. The first implication of this measure occurs in the term of the shareholder's discount rate ρ. If the company is allowed to deduct some rate of return defined at the level of interest rate, in that case the opportunity cost of equity-financed investment which happens to be the holders discount rate, must be corrected, lowered by factor (1 – t):

$$\rho = \left(\frac{1-m^i}{1-z} \right) r(1-t) \qquad (19)$$

This means that, the tax gain for the company (and the holder ultimately) under the ACE tax comes in a form of increased tax depreciation allowances expressed in present value terms, because of the reduced discount rate.

4.1. Allowance for Corporate Equity Tax System (ACE), with no tax credit available (t, $m^i = m^d$, c = 0)

The previous can be illustrated methodologically, first for this version and after for the version with an available tax credit:

$$\gamma = \frac{(1-m^d)}{(1-z)(1-c)} = \frac{(1-m^d)}{(1-z)} \qquad (20)$$

$$\tilde{p} = \frac{\rho}{(1-t)\gamma} = \frac{\dfrac{(1-m^i)r(1-t)}{(1-z)}}{(1-t)\dfrac{(1-m^d)}{(1-z)}} = \frac{(1-m^i)r}{(1-m^d)} \qquad (21)$$

$$\tilde{p} - r = \frac{(1-m^i)r}{(1-m^d)} - r = r\left[\frac{(1-m^i)}{(1-m^d)} - 1 \right] \qquad (22)$$

Expression (22) proves the similarities between the ACE system and the Fully Integrated Tax System. It is quite obvious that this condition which is determined only by the right of the holder to deduct the normal return, does not guarantee the neutrality between debt and equity. To do so, another additional condition must be satisfied and that is the equalization of the personal income tax rates ($m^i = m^d$). Full neutrality requires that taxes at the shareholder level are considered as well. If neutrality is achieved at the corporate level and if all returns (interest payments, dividends and capital gains) are taxed at the personal level at the same rate, the corporation in a

closed-economy setting will be indifferent between debt and equity and between external and internal equity as source of finance under the ACE tax system [15]. Accordingly, the full definition of this model of ACE tax system could be described as *(t, $m^i = m^d$, c = 0)*, and if the additional terms are implemented in (22), neutrality of the system is symbolically expressed as:

$$\tilde{p} - r = r\left[\frac{(1-m^i)}{(1-m^d)} - 1\right] = r\left[\frac{(1-m^i)}{(1-m^i)} - 1\right] = r(1-1) = r \cdot 0 = 0 \qquad (23)$$

4.2. Allowance for Corporate Equity Tax System (ACE), with an available tax credit (t, $m^i = m^d$, c = t)

Across the fact that this model of ACE, which allows a certain compensation in a form of credit, steps back from the incorporated principal of neutrality, and therefore is not accepted in the practice, we attend to explore it here and discover the potential properties within. The relevant methodological changes are presented below step by step:

$$\gamma = \frac{(1-m^d)}{(1-z)(1-c)} = \frac{(1-m^d)}{(1-z)(1-t)} \qquad (24)$$

And if $m^i = m^d$:

$$\rho = \left(\frac{1-m^i}{1-z}\right) r(1-t) = \left(\frac{1-m^d}{1-z}\right) r(1-t) \qquad (25)$$

Then:

$$\tilde{p} = \frac{\rho}{(1-t)\gamma} = \frac{\dfrac{(1-m^d)r(1-t)}{(1-z)}}{(1-t)\dfrac{(1-m^d)}{(1-z)(1-t)}} = (1-t)r \qquad (26)$$

$$\tilde{p} - r = (1-t)r - r = r - rt - r = -rt \qquad (27)$$

As it is seen from expression (27), here we have a corporate tax system that sustains a negative burden on the investment income. The level of the tax-induced benefit in this example is equal to the product of the real interest rate *r* and the corporate income tax rate *t*. Nevertheless, this effect demands the rudimentary condition of a positive corporate tax rate to occur. However, if that is not a case, which is less likely, the benefit from the corporate tax will disappear and the system will remain neutral *(t = 0, r = 0,10* and *$\tilde{p}$ - r = -0,10 x 0,00 = 0).*

To conclude: under the Allowance for Corporate Equity Tax System, the corporate income tax stops being a withholding tax on the normal return on equity-financedinvestment [16]. Introducing the ACE tax system effectively removes the tax differences among debt and equity, and produces neutrality similarly to the CBIT

system. But, unlike the CBIT system which lifts the smaller, zero wedge of debt finance, equalizing it with the higher positive one of equity finance, the ACE tax system does the alleviation in reverse direction. Actually, it lowers the positive wedge of equities, bringing it to zero wedge level of debt finance investment. Table 1 provides illustration of the arising effects from the ACE tax on investment.

Table 1: Illustration of the possible effects of ACE tax on investment

ACE tax variants	Example	Investment tax wedge $(\tilde{p} - r)$	Effects on equity – financed investment	Effects on normal return and economic rent	Effects on corporate finance	Effects on efficiency (allocation criteria)
$t, m^i = m^d, c = 0$	20%, 10%, 10%	0,00%	indifferent	rent taxed only	indifferent	neutral
$t, m^i = m^d, c = t$	20%, 10%, 10%	-2,00%	stimulating	subsidized	favors equity	distortive

Source: *Author's calculations and interpretations*

5. Allowance for Shareholders Equity Tax System (ASE)

The ASE tax system which was originally introduced by Sorensen [17] represents another hybrid system with certain similarities with the previously described ACE tax. But unlikely, the ASE permits a tax-deductible allowance for the normal return on equity at the shareholder level instead. It is essentially a "Nordic" model of tax firstly implemented in Norway in 2006, under the original name "rate-of-return allowance – RRA". For the personal income tax base at the shareholder level, which consist of dividends and capital gains, the government of Norway allows a deduction at the level of RRA, generally equal to the 3 month bonds interest rate. Another condition that has to be satisfied across the deductibility of the normal return, is the equivalence among the personal tax rate on interest income and the corporate income tax rate $(t = m^i)$, if neutrality of the system is concerned. This equality might not be required if, instead of implementing an allowance for shareholder equity, governments would provide a credit for shareholder equity (CSE) [18], which presents an alternative formulation of the same system. It is interesting that, under the ASE, the corporate tax still remains as a withholding barrier for both the normal return and the economic rent (not only for the rent as in the case of the ACE). Accordingly, the withholding function of corporate tax is being preserved in the case of ASE, as it continues to play the role of "backstop" for the personal income tax in whole.

Debt. There is no difference when the investment project is financed with external debt. Interest are deductible from the tax base, the investment tax wedge is 0 and the corporate tax system under the ASE regime prevails neutral to the investment decision.

New equity issue. The initial impact here, is again within the shareholder's discount rate ρ. The right to deduct an allowed rate of return from the personal income tax base (more precisely, in our case it is the dividend income tax base), lowers the opportunity cost of the external-equity investment with factor $(1 - m^d)$:

$$\rho = \left(\frac{1-m^i}{1-z} \right) r(1-m^d) \qquad (28)$$

Apparently, the tax gain under the ASE is identical to the immediate expensing on the dividend income tax base measured in present value terms, in amount to the dividend income tax rate at the personal level.

5.1. Allowance for Shareholder Equity Tax System (ASE), with no tax credit available ($t = m^i, m^d, c = 0$)

This true version of ASE is demonstrated methodologically, in the following steps:

$$\gamma = \frac{(1-m^d)}{(1-z)(1-c)} = \frac{(1-m^d)}{(1-z)} \qquad (29)$$

$$\tilde{p} = \frac{\rho}{(1-t)\gamma} = \frac{\dfrac{(1-m^i)r(1-m^d)}{(1-z)}}{(1-t)\dfrac{(1-m^d)}{(1-z)}} = \frac{(1-m^i)r}{(1-t)} \qquad (30)$$

$$\tilde{p} - r = \frac{(1-m^i)r}{(1-t)} - r = r\left[\frac{(1-m^i)}{(1-t)} - 1 \right] \qquad (31)$$

Analogically, equation (31) refers the resemblance between the ASE and the dividend exemption system, at least expressed in mathematical terms. To avoid distortion and secure the neutrality principle in taxation, we must add identical tax rates in the last equation ($m^i = t$), thus fully identifying the current model of ASE as ($t = m^i, m^d, c = 0$). If we add the condition $m^i = t$, within the investment tax wedge equation, we can easily observe derivation of neutrality as follows:

$$\tilde{p} - r = r\left[\frac{(1-m^i)}{(1-t)} - 1 \right] = r\left[\frac{(1-m^i)}{(1-m^i)} - 1 \right] = r(1-1) = r \cdot 0 = 0 \qquad (32)$$

5.2. Allowance for Shareholder Equity Tax System (ASE), with a tax credit available ($t = m^i, m^d, c = t$)

Regardless the fact that this model of ASE, allowing an additional compensation in a form of tax credit, is barely found in the practice, we briefly investigate the theoretical properties associated with it. The relevant methodological changes are presented analogically step by step:

$$\gamma = \frac{(1-m^d)}{(1-z)(1-c)} = \frac{(1-m^d)}{(1-z)(1-t)} \qquad (33)$$

And if $m^i = t$:

$$\rho = \left(\frac{1-m^i}{1-z}\right) r(1-m^d) = \left(\frac{1-t}{1-z}\right) r(1-m^d) \qquad (34)$$

Then:

$$\tilde{p} = \frac{\rho}{(1-t)\gamma} = \frac{\dfrac{(1-t)r(1-m^d)}{(1-z)}}{(1-t)\dfrac{(1-m^d)}{(1-z)(1-t)}} = (1-t)r \qquad (35)$$

$$\tilde{p} - r = (1-t)r - r = r - rt - r = -rt \qquad (36)$$

As it is seen from expression (36), here we have another situation when the corporate tax system generates a negative burden on the investment income. Repeatedly, the level of tax-induced benefit equals the product of the real interest rate *r* and the corporate income tax rate *t* (or the personal tax on interest income m^i, if the condition of $t = m^i$ is validated). Again, this effect demands the existence of a positive tax rates. Eventually, under a zero corporate and interest tax rate, the tax-induced benefit will diminish and the system will stay neutral *(t = mi =0, r = 0,10* and $\tilde{p}$ *- r = -0,10 x 0,00 = 0),* a scenario remarkably close to the one from the alternative Dividend Exemption Tax System, which is not a subject of discussion here. Table 2 describes the effects from the ASE tax on investment.

Table 2: Illustration of the possible effects of ASE tax on investment

ASE tax variants	Example	Investment tax wedge ($\tilde{p}$ - r)	Effects on equity – financed investment	Effects on normal return and economic rent	Effects on corporate finance	Effects on efficiency (allocation criteria)
t, $m^i = m^d$, c = 0	20%, 10%, 10%	0,00%	indifferent	rent taxed only	indifferent	neutral
t, $m^i = m^d$, c = t	20%, 10%, 10%	-2,00%	stimulating	subsidized	favors equity	distortive

Source: *Author's calculations and interpretations*

By comparing Table 1 and Table 2, it is easy to detect that the previous two Equity Allowance Systems sustain very similar effects concerning the equity-financed investments. In essence, both of them are able to bypass the normal return on equity from taxation, leaving under the force of wedge only the economic rent, and both of them effectively resolve the differences between equity and debt. Then, what is the dividing line between the ACE and the ASE tax system? The answer is in the location specific differences in taxation of corporate income. Namely, ACE is a source-based tax allowance while the ASE is a residence-based tax allowance [19]. The first

one affects investment income from the source countries, and the second one resident shareholders and capital income from the resident countries. Because the residence-oriented ASE requires more complex regulation rules concerning the flows of capital and profit repatriation, it is argued also, that the administration costs and the risk of evasion are much higher in comparison of the ACE tax system. At the finishing point, the effects from taxation on investment performance are summarized in Table 3, and the qualitative attributions of the analyzed basic model tax systems are given in Table 4.

Table 3: The effects from taxation on investment performance

Only corporate taxes	**Investment tax wedge ($\tilde{p}$ - r)**
Debt	0
New equity issues	$r\left[\frac{1}{(1-t)}-1\right]$ *or* $\frac{rt}{(1-t)}$
Classical Corporation Tax System (CCT)	
Debt	$\frac{rt}{(1-t)}$
New equity issues	$r\left[\frac{(1-m^i)}{(1-t)(1-m^d)}-1\right]$
Allowance for Corporate Equity Tax System (ACE)	
Debt	0
New equity issues: Basic model of ACE without a tax credit **($t, m^i = m^d, c = 0$)**	$r\left[\frac{(1-m^i)}{(1-m^d)}-1\right]$ *when* $m^i = m^d$**:** 0
New equity issues: Basic model of ACE with a tax credit **($t, m^i = m^d, c = t$)**	$-rt$ *when* $t > 0$
Allowance for Shareholder Equity Tax System (ASE)	
Debt	0
New equity issues: Basic model of ASE without a tax credit **($t = m^i, m^d, c = 0$)**	$r\left[\frac{(1-m^i)}{(1-t)}-1\right]$ *when* $t = m^i$**:** 0
New equity issues: Basic model of ASE with a tax credit **($t = m^i, m^d, c = t$)**	$-rt$ *or* $-rm^i$ *when* $t = m^i > 0$

Source: Summary and review of author's calculations

Table 4: Summary of qualitative attributions of basic model tax systems

Corporate tax	Effects on debt finance	Effects on new equity finance	Effects on economic rent	Effects on normal return	Withholding function criteria	Location specific criteria	Overall allocation criteria
CCT	favors	discrimi-nates	taxed	taxed	withholds rents and normal return	source and residence-based	distortive
ACE	indifferent	indifferent	taxed	not taxed	Withholds only rents	source-based	neutral
ASE	indifferent	indifferent	taxed	not taxed	withholds rents and normal return	residence-based	neutral

Source: Author's interpretations

6. Conclusion

The proposals of the OECD examined here, such as, the Allowance for Corporate Equity Tax System (ACE) and the Allowance for Shareholders Equity Tax System (ASE), indeed performed satisfactory in the terms of neutrality in contrast to the traditional Classical Corporation Tax System (CCT). According to the results on the investment tax wedge coefficient, derived from the completed analysis, present similar effects concerning the equity-financed investments. Basically, both of the systems do not discriminate equity in favor of debt and both of them are able to omit the normal return on equity while simultaneously tax the economic rent. Distinction between the Allowance for Corporate Equity Tax and the Allowance for Shareholders Equity Tax is found in the location specific differences in taxation of corporate income. Specifically, the source-based ACE affects investment income from the source countries, and the residence-oriented ASE the capital income from the resident countries. Complex regulation rules in the case of residence-oriented ASE increase the agency costs and at the same time worsen the control of capital flows, consequently enabling loopholes and possibilities for evasion. Also, the withholding function of corporate tax is being preserved in the case of ASE, as it continues to play the role of "backstop" for the personal income tax, while in the case of ACE the same constatation could not be generalized.

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